

**CERTIFICATE OF TRANSMISSION UNDER 37 C.F.R. §1.8**

I hereby certify that this correspondence, including recited attachments, is being electronically transmitted to the Commissioner for Patents in the United States Patent and Trademark Office on the date below:

Date: February 20, 2008 Name: Richard E. Stanley, Jr. Signature: /Richard E. Stanley, Jr./ Reg. No. 45,662

Our Case No. 4865-162

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:	)	
	)	
David E. Daws et al.	)	
	)	Examiner: Rudy Zervigon
Serial No.: 10/658,988	)	
	)	Group Art Unit No.: 1763
Filing Date: September 9, 2003	)	
	)	Confirmation No.: 4219
For: HARDWARE ASSEMBLY FOR	)	
CVI/CVD PROCESSES	)	

**DECLARATION OF MR. JAMES W. RUDOLPH  
UNDER 37 C.F.R. § 1.132**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Dear Sir:

Now comes James W. Rudolph, one of the inventors of the above-identified patent application, who declares and states:

1. I live at Colorado Springs, CO and am currently employed as a Principal Engineer at Goodrich Corp. I have been employed by Goodrich Corp. since 1992. During my employment at Goodrich Corp. starting in 1992, I have been responsible for research and development work for CVI/CVD processes and furnace designs for densifying carbon-carbon brake disks. I was also employed in the carbon-carbon industry prior to my employment at Goodrich Corp. and have over 20 years of experience in the carbon-carbon industry. I consider myself to be one of ordinary skill in the art of furnace designs for densifying carbon-carbon brake disks and have had such

skill since the time that the subject matter of the above-identified application was conceived.

2. I have reviewed the Office Action dated September 20, 2007, in the above-identified patent application. My understanding is that the application has been rejected based upon Christin et al. (U.S. Patent No. 5,904,957) alone and in combination with other prior art references. I have reviewed Christin et al. in an effort to understand the Examiner's rejection of my application. After a careful review of Christin et al., I respectfully disagree with the Examiner that Christin et al. discloses my invention or that my invention would have been obvious from Christin et al. To support my position that my invention is new and not obvious, I make the following evidentiary statements.

3. I have reviewed the written description of Christin et al., and I find no reference to a portion of gas passing around the outer edge of the base plate 22. If one were to assume from Figure 2 of Christin et al. that a portion of gas passes through the lateral gap between the outer edge of base plate 22 and the wall of the furnace, it is my opinion based upon my experience in this field that any such gap would be exceedingly small and undesirable. In my experience, the diameter of the type of base plate used in Christin et al. is usually designed to be 0 to ½ inch less than the diameter of the susceptor wall. It is necessary in a conventional furnace to minimize any such gap between the base plate and the susceptor wall because any clearance between the base plate and the susceptor wall will have several undesirable effects.

4. First, any gas that flows between the outer edge of the base plate and the susceptor wall will be uncontrolled. Specifically, any clearance that exists between the outer diameter of the base plate and the susceptor wall will not be constant and even around the diameter of the base plate. The reason for this is that in most furnaces it is not generally possible to perfectly line up the base plate with the susceptor wall so that the base plate is perfectly coaxial with the susceptor wall. Thus, the base plate is usually located closer to one side of the furnace than the other side. In addition, the susceptor wall and the base plate are not perfectly round, and thus, vary in diameter about the circumference. As a result, in any particular case, the clearance between the base plate and the susceptor wall can be expected to vary anywhere from 0 inches

along one portion of the outer diameter and  $\frac{1}{2}$  inch around another portion of the outer diameter. Therefore, any gas flow through the clearance gap between the base plate and the furnace wall will not be consistent and will vary around the circumference of the base plate.

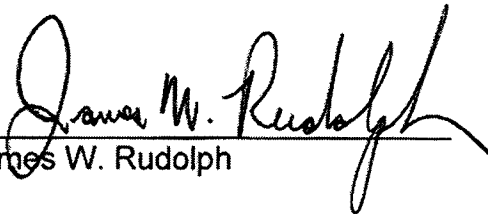
5. Second, the gas flow that flows around the outer edge of the base plate is not useful for the intended purpose of infiltrating the porous structures with a carbon matrix. Specifically, the gas that flows around the outer edge of the base plate flows straight up along the susceptor wall and does not flow uniformly around each stack. For example, referring to Figure 2 of Christin et al., assuming that a small portion of gas flows up along the right wall of the furnace, this portion of gas will only flow along the right side of the right-most stack. As a result, no gas flows along the left side of the right-most stack. Similarly, none of the gas that passes around the outer edge of the base plate flows along the outer region of the center stack. Moreover, if it is assumed that the preheater in Christin et al. is not sealed as the Examiner appears to argue, the gas that flows through the clearance gap between the base plate and the susceptor wall constitutes escape gases that have not fully passed through the preheater. As a result, the temperature of these escape gases will be uncontrolled, which will make these gases even less useful for densifying the porous structures in the stacks. Therefore, to the extent that a portion of gas escapes through the clearance between the base plate and the susceptor wall, this portion serves no useful purpose.

6. Third, any gas that passes through the clearance between the base plate and the susceptor wall will produce undesirable buildup on the susceptor wall, the furnace hardware and the stacks. Specifically, any gas that escapes through this gap passes through a small opening (the clearance gap) to a large open space (the furnace volume). As a result, the gas experiences a very large residence time in the furnace (i.e., the time it takes the gas to pass from the inlet to the outlet) and will form soot, tar and seal-coat on the furnace walls, the furnace hardware and portions of the stacks.

7. I state that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with knowledge that willful false statements are the like so made are punishable by fine or imprisonment, or both, under Section 1001 of

Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

Respectfully submitted,

  
James W. Rudolph